

recent visit to Germany has so greatly impressed my friend Prof. Hubrecht of Utrecht, to whom I told it, that I venture to think you will find it of sufficient interest to be laid before your readers.

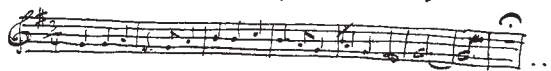
My sister, Frau Prof. Grosse of Brunswick, possesses an old bullfinch which pipes, among other tunes, "God Save the King" beautifully, even embellishing it now and then with some charming little gracenotes. For some time he was the only bird in the house, until, about a year ago, my sister received the present of a canary bird, a lovely but untrained songster, singing, as they say in Germany, "as his beak was grown."

The cages containing the two birds stood in two adjoining rooms. At first one of the birds would be silent when the other was singing. Gradually however the young canary bird commenced to imitate the tune of the bullfinch, trying more and more of it at a time, until after nearly a year's study he had completely mastered it, and could pipe it quite independently by himself. As I said before, this, in a canary bird, though a rare accomplishment, is nothing very extraordinary or unheard of.

Now, however, I come to my point. What I am going to relate seems to me so wonderful that I should consider it absolutely incredible had I not with my own ears heard it, not once, but dozens of times within the few days of my visit.

When the bullfinch, as sometimes happened, would, after the first half of the tune, stop a little longer than the rhythm of the melody warranted, the canary would take up the tune where the bullfinch had stopped, and properly finish it. This, then, is what I heard:—

Bullfinch (in one room)



Canary (in another)



I should be glad to read in a further issue of your paper whether you share my astonishment, or if any of your readers can perhaps recall, or have ever heard of, a similar experience.

GEORGE HENSCHEL.

Kensington, April.

Mendel's Principles of Heredity in Mice.

IN NATURE of March 19 Mr. Bateson refused to discuss the eye-colour of Mr. Darbshire's mice as a simple character, separable from coat-colour. He then treated Mr. Darbshire's results as dependent on gametes of two kinds; one, G, bearing the characters "white coat and pink eye," the other, G', bearing "colour in the coat and pink eye." The hybrids resulting from the cross were said to be of constitution GG', and their offspring were represented, in constitution and in relative frequency, by

$$GG + 2GG' + G'G'.$$

Hybrids are here represented as producing gametes of two kinds only, each kind like that of one pure race; eye-colour and coat-colour are transmitted together in one unresolved "allelomorph." The mice in any one of the three groups are said to be formed from similar pairs of gametes, and they should themselves be similar; but they are not. The colour in the coat of a mouse GG may be yellow, or some shade of wild-colour, or black; that of a mouse G'G' may be yellow, fawn, or "lilac."

In NATURE of April 23 Mr. Bateson abandons his first formula; he now says (1) that more than two kinds of gametes take part in the first crosses, since the gametes of one or both pure races are heterogeneous; (2) that coat-colour is split into simpler elements when the hybrids form gametes. The heterogeneity of gametes in two races, both of which breed true, while one has been declared by Mr. Bateson to be universally recessive, is a doctrine too amazing for brief treatment; I therefore consider only the second of the new assumptions.

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The hypothesis of March 19, invoking only two kinds of gametes, supposes that one out of every four offspring of hybrids will be a recessive albino, and this is not contradicted by the facts: but the hypothesis regards black and yellow coat-colour as produced by identical pairs of gametes. The new hypothesis provides different gametic elements for the black and for the yellow mice, but it reduces the number of "recessive" albinos among the offspring of hybrids to a maximum of one in nine. The two "Mendelian predictions" which Mr. Bateson has so far uttered *ex post facto* are mutually contradictory; with which of them is the inheritance of coat-colour "in punctilious agreement"?

Oxford, April 24.

W. F. R. WELDON.

The Discovery of Japan.

FROM a review in NATURE of November 13, 1902 (vol. lxxvii, p. 28), I gather Herr Hans Haas, like many other writers on Japan, considers Ser Marco Polo the first who brought any news of Japan to the west. In this connection, it will be interesting to note that in his "Six Voyages," Paris, 1676, Tavernier tries to identify a local name of the classic geographers, *Jabadi*, if I remember correctly, with the ancient vernacular designation of the empire, *Yamato*, or rather with its Chinese rendering, *Yamadai* or *Jabatai*.

Whether this identity be true or not, it is almost certain that Japan was well known to the mediæval Arabs much prior to Marco Polo. In a French translation of the "Voyages of the Two Arabs in the Ninth Century," an island near China is mentioned the inhabitants of which used to send a tribute to the latter, in the firm belief that it would make their own country peaceful. This island seems to point to Japan, the story being apparently a version of the legend, recorded in Wang Chung's "Lun Hang," first century A.D., that under Ching-Wang of the Chau dynasty (c. 1100 B.C.), China enjoyed such an extraordinary peace that it caused even the winds and waves in the neighbouring States to be perfectly calm, on which account the people of Laos gave him thanks by their envoys, who reached the capital after several years' journey, and the Japanese made him presents of the Salty Herb (now supposed to mean the *Angelica Kiusiana*, Maximowicz). The "Second Annals of Japan" mentions several Arabs, including women, passing into or becoming settled in Japan during the eighth and ninth centuries. This is no wonder, for, in those ages, China under the grand dynasty of Tang was so prosperous and powerful that nearly all Asiatic peoples of significance vied in asking her favours, and they saw each other very frequently in that empire; besides, doubtless there were many Japanese who passed through China into the lands then called her territories or tributaries; thus, Twan Ching-Shih, in his "Miscellany," written ninth century A.D., speaks of his meeting with a Japanese priest, who came back from his travels in India, where he witnessed the figures of the famous Chinese pilgrim, Huen-Tsiang, revered in the Buddhist churches. Indeed, the "Second Annals" relates how, in the year 753 A.D., the Japanese ambassador was successful in a dispute with the Arabian about the first seat of honour on occasion of a state banquet on the New Year's Day. Add to these, in the "Hokuhen Zuihitsu," written eighteenth century, it is argued that in the Middle Ages there were mutual acquaintances between the Japanese and the Persians.

When we see in the sixteenth and seventeenth centuries (in part) the Spaniards and Portuguese flourishing in the Japanese ports under the native appellation *Namban*, or South Barbarians, it is very striking to find in a memoir evidently written in the fifteenth century, entitled "The Successions of Governors of a County in Wakasa" (in Hanawa's "Collection," ed. 1894, p. 375), the following passage:—

"June 22, 1408. A vessel of the Nambans arrived (in the province of Wakasa). Their emperor's name is Arekishinkei, and the envoy's Mongwan-hon-a. His Majesty's presents to the Japanese emperor were a living black elephant, a mountain-horse (sic), two pairs respectively of the peafowl and parrots, and various other articles. The ship was wrecked by a storm, and stranded on November 18, but, after being reconstructed, started for China on October 1, 1409."

This took place just 135 years before the advent of the Portuguese deserters Herr Haas describes as the first Europeans reaching Japan; and if so, what were these "Nambans" of the years 1407-8, the first instance, so far as I know, of the name in the Japanese records of this sort?

In the same review, the writer, talking about Xavier's labours, says:—

"What would be interesting and instructive to know would be what the Japanese, especially the Buddhists and Confucianist scholars, thought of his doctrines. No hint has come down to us—perhaps they took no thought of a strange religion that seemed of no importance."

As he expresses it at the same time, Xavier's stay was too short to qualify him to make his dogmatic teaching in its utmost expression; but one must not conclude thereby that in the same century Japan was totally destitute of the native scholars of repute taking interest in the subject of Christianity. Thus we read in a eulogy on Master Seigwa (1561-1619), the greatest of all Confucianists of that age, that he was thoroughly learned not only in all Japanese and Chinese literatures, but, moreover, "as well in the books of the Buddhists in India as in the doctrines of Jesus Christ of the South Barbarians" (Oota, "Ichiwa Ichigen," ed. 1885, tom. xix, fol. 19, b).

As the native documents and treatises of any concern to Christianity were well-nigh annihilated under the most rigorous inquisitions, which were mainly incurred by the so-called South Barbarians intermeddling with the political affairs of the country, and which that religion continued to undergo during the two centuries of the Tokugawa Shōgunacy, practically no hint has come down to us of what the native scholars thought about it before the persecution began. From what are left dispersed in their works, however, we may be fair in judging that most of the intelligent Japanese, then and directly after, described in the tenets and rituals of Roman Catholicism nothing but an especial form of Buddhism. To the Europeans, Nobunaga's dictum on its toleration is well known—"While there exist so many sects already, why do we not let this sect stand?" Kumazawa Bōkai (1619-91), the renowned Confucianist reformer in politics, calls the creed simply Southern Buddhism, i.e. Buddhism of the South Barbarians. Later, Arai Hakuseki (1657-1723), after repeatedly giving ear to the Roman missionary, J. B. Sidoti, is said to have remarked upon the subject, "His doctrine is as absurd as Buddhism, they differing from one another only in the points of their terminology" (Amenomori's "Adversaria," ed. 1892, vol. x, p. 86). Parallel to these, I remember I have read in a letter of Xavier's contained in Ramusio's "Viaggi e Navigazioni" a passage implying his recognition of some Christian essence in the Buddhist dogmas then current in Japan.

As I recollect there was in a back number of NATURE a certain though very brief reference to a Life of J. B. Sidoti, it will be *apropos* of this letter to give a few facts relating to him, which, I think, are not so well known now among Christians as they ought to be. Arai Hakuseki, mentioned above, was a man of singular parts, extensively erudite, notorious in poetry even in China, very active in politics of the court at Yedo, and nowadays nobody denies him the honour of the first introducer of the western science into the Land of the Rising Sun. This innovation, however, was simply the result of his official interviews with that devoted but unfortunate missionary in 1709 A.D. Sidoti professes to have made himself adept in the Japanese language at Rome, but after all his acquirements appear to have been too limited to make him speak freely in it. So Hakuseki made every effort in his brain to secure from him accurate information on subjects of the regions, then perfectly unknown to the Japanese, through a Dutchman's interpretation, observing on the difficulties of the task at the outset, "Still is it reasonable to suppose that all this stranger's words are nothing but a shriek's shrieks?" The results of these conversations were the two works "Choice Reviews of a Foreigner's Tales" and "A Memoir on the Western Ocean," which formed the principal cause of the eighth Shōgun's edict to tolerate the reading of the European books pertaining to science and arts, the *sine qua non* of their wholesale importation in these present days. That all the conduct of Sidoti greatly affected Japanese minds, in spite of their hatred of his creed, is borne out by a letter he wrote in a prison, whereby he petitioned the

authority to chain him tightly in cold winter nights, in order to let the miserable watchmen about him enjoy their sleep at ease (see Oota, *op. cit.*). Immediately after Hakuseki's remark on his religion quoted above, this passage follows:—"But his personality was so uncommon that it makes me ever unable to forget him!" And it will be greatly gratifying and edifying to the modern Christians to reflect upon how powerful the unparalleled morality of this single, forlorn missionary was after his death, in effecting the reopening of the doors, which his nominal brethren, the very worthy "South Barbarians," had caused the Japanese to shut against themselves. In fact, Yuasa's "Miscellany from a Literary Society" tells us, "Hakuseki used to say all Sidoti's deportments convinced him in the belief that even the Five Virtues of our Sage were no more than what that missionary daily carried himself with"; an unexampled encomium uttered on a Christian by the followers of the great Chinese philosopher!

KUMAGUSU MINAKATA.

Mount Nachi, Kii, Japan, March 10.

Sir O. Lodge and the Conservation of Energy.

THE utterances of many men of science as to the doctrine of the conservation of energy betray a tendency to exaggerate the importance of the position of this principle in the general scheme of physical science. It appears sometimes to be forgotten that the principle of energy, if applied to even the simplest dynamical system which is possessed of more than one degree of freedom, is, taken by itself, wholly insufficient for the determination of the motion of such system. Although the principle has been of inestimable value as regulative of the relations between the different forms of molar, molecular, and corpuscular energy which the state of our knowledge compels us to distinguish, it is nevertheless true that in an ultimate dynamical formulation of physical phenomena, the principle of energy descends to the rank of being one integral only of the dynamical equations of a system, a knowledge of the other integrals being indispensable for the complete determination of the motions of the system.

This tendency to exaggeration is illustrated in a very striking manner in the interesting paper by Sir O. Lodge on "Interaction between the Mental and the Material Aspects of Things" (see NATURE, April 23, p. 595). Sir O. Lodge, in discussing the question whether the assumption of a direct action of life upon matter is consistent with physical laws, advances the theory that, although life cannot generate mechanical energy, it can exert guiding mechanical forces which do no work on matter. Sir O. Lodge appears to think that by restricting the action of the psychical on the physical in this way, he has suggested a compromise which ought to satisfy the supporters of naturalism whilst it at the same time leaves sufficient play for the action of the psychical.

The really fundamental issue between the advocates of thorough-going naturalism and their opponents is at bottom the following:—Can the human body, or the physical world including living organisms, be rightly regarded as theoretically completely representable as a dynamical system, in such a manner that the whole of the motions of the system are completely determinate in accordance with the laws of dynamics? Is the physical a complete system without taking account of any action on it arising from the psychical, or is it, on the other hand, necessary to suppose that an action of the psychical on the physical exists, without which the actual motions of the physical cannot be completely determined? If the latter question be answered affirmatively, then it makes no difference in principle whether such action of the psychical does work, or whether it can be represented by the introduction into the dynamical system of *ex hypothesi* unknown frictionless constraints; in either case the laws of physics, regarded as a sufficient system for the determination of all motions, fall to the ground.

Sir O. Lodge's contention "that the fundamental laws

1 Mildness, Faithfulness, Self-Respect, Respect to Others, and Compassion. When asked about Confucius's character, Tszu-Kung, the most eloquent of all his disciples, enumerated these as its five components. In the eighteenth century there was a Confucianist master in Japan who opined it wise to substitute in the temples the five letters signifying them written on scrolls for the images of the philosopher. See the "Analects of Confucius" and the "Kwagetsu Shinshi."